

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



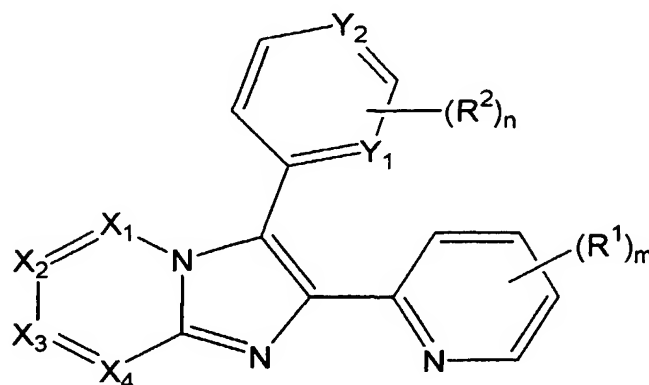
(43) International Publication Date  
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number  
**WO 2004/021989 A3**

- (51) International Patent Classification<sup>7</sup>: **C07D 237/00**, 239/00, A01N 43/00, A61K 31/535
- (74) Agent: **GARRETT, Arthur, S.**; Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, NW, Washington, DC 20005-3315 (US).
- (21) International Application Number:  
PCT/US2003/027721
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date:  
5 September 2003 (05.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/408,812 6 September 2002 (06.09.2002) US
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): **BIOGEN IDEC MA INC.** [US/US]; 14 Cambridge Center, Cambridge, MA 02142 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **LEE, Wen-Cherng** [US/US]; 192 Spring Street, Lexington, MA 02421 (US). **CARTER, Mary, Beth** [US/US]; 179 Wright Street, Arlington, MA 02474 (US). **SUN, Lihong** [US/US]; 15 Mystic View Terrace, Arlington, MA 02474 (US). **CHUAQUI, Claudio** [CA/US]; 30 Chandler Street, Apt. #1, Somerville, MA 02144 (US). **SINGH, Juswinder** [GB/US]; 94 Heritage Avenue, Ashland, MA 01721 (US). **BORIACK-SJODIN, Paula** [US/US]; 46 Florence Road, Waltham, MA 02453 (US). **CHOI, Michael, J.** [US/US]; 11 Lawrence Street, #1, Cambridge, MA 02139 (US).
- Published:  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:  
23 September 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: IMIDAZOLOPYRIDINES AND METHODS OF MAKING AND USING THE SAME



(I)

(57) Abstract: Compounds of formula I possess unexpectedly high affinity for Alk 5 and/or Alk 4, and can be useful as antagonists thereof for preventing and/or treating numerous diseases, including fibrotic disorders. In one embodiment, the invention features a compound of formula I:

WO 2004/021989 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/27721

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07D 237/00, 239/00; A01N 43/00; A61K 31/535

US CL : 544/224, 242.; 514/183, 228.8, 231.5

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 544/224, 242.; 514/183, 228.8, 231.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2001357977 A2 (TAGUCHI et al), 26 November 2001, see abstract	1-48

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and no: in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

10 July 2004 (10.07.2004)

Date of mailing of the international search report

13 AUG 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450.

Facsimile No. (703) 305-3230

Authorized officer

KENNETH A. WIEDER

Telephone No. 703 305-7608